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A system wide electronic health record checklist to improve comorbidity screening of children with inflammatory bowel disease

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Author Contributions

JH = Jeannie Huang
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JH and JP contributed substantially to the conception and design of the described work. JH wrote the initial draft and RC, RY, JP revised it critically for important intellectual content. RC and RY participated in data acquisition, management and analyses, overseen by JH. JH, RC, RY, and JP provided final approval of the version to be published and agreed to be accountable for all aspects of the work and ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Electronic health record (EHR) clinical decision support tools have potential to improve care by standardizing practice¹. Inflammatory bowel disease (IBD) afflicts >70,000 North American youth², most of whom are treated at health centers serviced by EHR systems. Published guidelines promote scheduled monitoring of youth with IBD for nutrition deficiencies, bone pathology, ocular and skin diseases, and infectious complications³. We developed and evaluated the effect of an EHR checklist activity on annual compliance with screening recommendations in a cohort of IBD youth followed at an academic pediatric gastroenterology subspecialty practice.

The IBD-Health Maintenance Activity (IBD-HMA, Figure 1) provides a checklist to providers that documents performance/deficiency of recommended nutrition (iron, vitamin D, vitamin B12, folate), bone density (dual-energy X-ray absorptiometry scan (DXA)), ocular and skin disease (ophthalmology and dermatology referrals), and infectious disease (tuberculosis, hepatitis, and varicella) screenings annually with the exception of DXA (every 2 years) and varicella zoster and hepatitis B immune status (once). The IBD-HMA will be available to Epic EHR system users in May 2020.

Compliance with guidelines was evaluated in a convenience sample of 40 IBD patients [22: 18 (M:F), 16(2) [mean(standard deviation)] years old, 32:2:6 (Crohns; IBD-U; ulcerative colitis)]. Compliance with screening guidelines was evaluated across the cohort the year before and the year after launch of IBD-HMA. Compliance scores before and after IBD-HMA launch were compared using the ANOVA test (JMP, version 14.2, Cary, NC).

Prior to IBD-HMA launch, average compliance was 5 (3) [mean(standard

deviation)] of the ten recommended guidelines. In comparison, after IBD-HMA launch, average compliance with 7 (3) recommendations was achieved ($p < 0.02$).

Prior to IBD-HMA launch, a patient's EHR was manually reviewed for performance of screenings with written notification of deficient screenings at clinical visit to the provider to prompt compliance. Required personnel time for manual pre-visit chart review was 20 hours/week. In contrast, since launch of IBD HMA, no pre-visit chart review time has been necessary.

In conclusion, we demonstrate the efficacy of an automated EHR checklist to remind physicians caring for pediatric IBD patients to perform recommended screenings. Compliance with published screening guidelines was significantly greater with IBD-HMA than without at one institution. Automation enabled staff function reassignment and a gain of 20 hours of staff time per week. For users of Epic EHR, this activity will be released for widespread use in May 2020 and potentially enable standardized delivery of quality care to IBD youth.

Figure Legend

FIGURE 1. Layout/Organization of IBD HMA.

References

1. Utidjian L, et al. *Current Treatment Options in Pediatrics*. 2015;1:48-58
2. Rosen MJ, et al. *JAMA pediatrics*. 2015;169(11):1053-1060.
3. DeFilippis EM, et al. Health Care Maintenance for the Pediatric Patient With Inflammatory Bowel Disease. *Pediatrics*. 2016;138(3).

Screening Item	Compliance Status	Results (if Labs/Radiology)
Item	Delinquent <i>(color coded for easy identification)</i> Compliant <i>NOTE: The checklist will self sort the delinquent items to the top of the list for easy identification of deficient items.</i>	Abnormal <i>(color coded for easy identification)</i> Normal